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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,334	12/16/2003	Richard A. Craig	50005-167	7550
32215	7590	12/07/2005		
KLARQUIST SPARKMAN, LLP 121 SW SALMON STREET, SUITE 1600 ONE WORLD TRADE CENTER PORTLAND, OR 97204			EXAMINER PALABRICA, RICARDO J	
			ART UNIT	PAPER NUMBER
			3663	

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/737,334	<b>Applicant(s)</b> CRAIG ET AL.	
	<b>Examiner</b> Rick Palabrica	<b>Art Unit</b> 3663	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 16-46 is/are pending in the application.
- 4a) Of the above claim(s) 21,23,24,35 and 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 16-20,22,25-34,36,37 and 39-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/9/05</u> . | 6) <input type="checkbox"/> Other: ____  |

### DETAILED ACTION

1. Applicant's election without traverse of Group I (Process) and election with traverse of species A and A2(unexploded ordnance), D (collimating material), fission neutron source,  $^3\text{He}$  gas proportional counter, and  $^{10}\text{B}$  containing neutron shield, is acknowledged.

Applicant traverses the Examiner's statement that there appears to be no generic species to Group I. Applicant asserts, for example, that claim 16 is generic to the species recited in claims 20-23. The Examiner disagrees. The generic claim referred to by the Examiner pertains to the entire Group I, i.e., claims 16-46, which includes three independent claims, i.e., claims 16, 25 and 29. Claim 16, which the Applicant alleges as generic applies only to a sub-group of Group I, i.e., those in claims 16-24.

Even assuming that Applicant's argument is valid, Applicant's traversal of the species election requirement implies that the species identified by the examiner in the 10/5/05 Office Action do not possess mutually exclusive characteristics and are obvious variants of each other. If so, then applicant should clearly admit on record that this is the case in a response to this Office Action.

The Examiner's restriction requirement is appropriate because of the numerous species (at least a dozen) recited. Each species would require a separate search in view of their mutually exclusive characteristics, and these individual searches would not be co-extensive.

Based on Applicant's election, claims 16-20, 22, 25-34, 36, 37, and 39-46 read on the elected invention. Claims 21, 23, 24, 35, and 38 are withdrawn from consideration being directed to a non-elected invention.

The restriction requirement is still deemed proper and is therefore made **FINAL**.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 16-20, 22, and 29-34, 36, 37-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 16 recites the limitation, "measuring a portion of said stream of fast neutrons that is backscattered from hydrogen in said target after a time delay ..." . The hydrogenous material that Applicant's method claims to detect may contain not only hydrogen but other elements, as well, e.g., oxygen, carbon. These other elements may be present either as inadvertent or inherent or designed impurities. These other elements are capable of back scattering neutrons in the same manner as hydrogen.

Art Unit: 3663

There is neither an adequate description nor enabling disclosure as to how and in what manner one can identify that a neutron has been backscattered by hydrogen and not by other elements in the target. For example, where the material contains both hydrogen and oxygen, a neutron backscattered by oxygen can have the same backscattered energy as a neutron backscattered by hydrogen.

As to claims 16 and 29, there is neither an adequate description nor enabling disclosure as what is all encompassed by the term, “a portion of said stream of fast neutrons. For example, does “portion” mean, 10%, 50%, etc. and also which part of the stream, e.g., near the beginning, the middle or near the end of the stream?

Claim 29 recites the limitation, “providing at least one sensing head comprising a neutron sensor and a neutron shield positioned such that a portion of said stream of fast neutrons is backscattered from said target to said neutron sensor.” There is neither an adequate description nor enabling disclosure as to how and in what manner said positioning of the sensor and shield results in backscattering of neutrons from the target. Backscattering of neutrons is due to nature of the target itself rather than the position of the sensor and shield.

3. Claims 16-20, 22, 25-34, 36, 37, and 39-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16 and 29 are vague, indefinite and incomplete, and its metes and bounds cannot be determined, particularly in regard to the term/phrase “a portion of

Art Unit: 3663

stream of fast neutrons." It is not known what all is meant by or encompassed by this term/phrase.

Claim 16 recites the limitation "the time" in line 4. There is insufficient antecedent basis for this limitation in the claim.

As to claim 19, the term/phrase "upper level discriminator setting" is a relative term which renders the claim indefinite. The term/phrase "upper level" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Thus, the metes and bounds of the claim cannot be determined.

Claim 25 recites the limitation "the amount" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 29 recites the limitations "the time" in line 6 and "the amount" in line 9. There are insufficient antecedent bases for these limitations in the claim.

Claim 33 recites the limitation "the spatial location" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 42 recites the limitation "vehicle with extension arm" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claims 44-46 recite the limitation, "at least about 70ns." The terms, "at least" and "about" both designate approximations. The combination of these two approximations is vague and indefinite, and the metes and bounds of the claims are undefined.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 16-20, 22, 25-33, and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Gomberg U.S. 4,864,142) or Schultz (U.S. 5,200,626).

Gomberg discloses a non-invasive method of detecting hydrogenous materials such as explosives by neutron scattering (e.g., see Abstract and Figs. 2 and 5). His method includes; a) directing a stream of fast neutrons 16a toward a target 22 (see col. 12, lines 30+); b) detecting the time when the stream of fast neutrons is emitted and measuring a portion of backscattered neutrons from hydrogen by time of flight mode of operation (see col. 12, lines 55+); c) communicating measurement to a user a display 38 (see col. 12, lines 53+).

As to claims 17, 26, and 30 the measurement after a time delay and a window, and disablement of the sensor after a window, are inherently performed as part of the time of flight measurement.

As to claims 18, 19, 27, 31 and 32, absent Applicant's definition of "upper level discriminator setting" Gomberg's method inherently reads on the measurement setting that excludes signals with energies or amplitudes higher than the hydrogenous elements being detected by the method.

As to claim 25, Gomberg's method discriminates against detecting fast neutrons not scattered from hydrogenous materials in the target (see col. 11, lines 40+).

As to claim 29 and the limitation of a neutron shield in the sensing head, Gomberg discloses an embodiment shown in Fig. 5 that includes a neutron sensor 20 and a neutron shield 24 such that a portion of neutrons is back scattered from the target to the sensor (see also col. 14, lines 52+).

As to claim 33, Gomberg's method uses careful placement of detectors 20 (see col. 11, lines 24+) for spatially resolving the neutron signal.

As to claim 43, see Fig. 2 that shows the neutron signal being communicated to the display ("user interface") by the controller 34 and analyzer 36.

Schultz et al. disclose a method of detecting hydrogenous materials such as explosives by neutron scattering (e.g., see Abstract and Fig. 4). Their method includes; a) directing a stream of fast neutrons from a pulsed neutron generator 34 toward a target 26; b) detecting the time when the stream of fast neutrons is emitted and measuring a portion of backscattered neutrons from hydrogen by time coincidence techniques (see col. 8, lines 50+ and col. 9, lines 19+); c) communicating measurement to a user by video tape or computer (see col. 7, lines 36+).

As to claims 17, 26, and 30 the measurement after a time delay and a window, and disablement of the sensor after a window, are inherently performed as part of the time coincidence techniques of Schultz et al.

As to claims 18, 19, 27, 31 and 32, absent Applicant's definition of "upper level discriminator setting" Schultz et al.'s method inherently reads on the measurement



setting that excludes signals with energies or amplitudes higher than the hydrogenous elements being detected by the use of a multi-channel analyzer and an appropriately programmed computer (see col. 7, lines 40+).

As to claim 25, Schultz et al.'s method discriminates against detecting fast neutrons not scattered from hydrogenous materials in the target by neutron detectors 40b and 40c (see col. 9, lines 20+).

As to claim 29 and the limitation of a neutron shield in the sensing head, Schultz et al. disclose a neutron sensor 40 and neutron shield 18 (see Fig. 4, col. 7, lines 26+).

As to claim 33, Schultz et al.'s method uses careful placement of neutron detectors 40 for spatially resolving the neutron signal (see Fig. 2 and col. 9, lines 25+).

As to claim 43, the neutron signal being communicated to a computer memory ("user interface") by an appropriately programmed computer (see col. 7, lines 41+).

5. Claims 34 and 42 are rejected under 35 U.S.C.102(b) by Gomberg.

As to claim 34, Gomberg's method uses a collimator 18 (see col. 12, lines 30+) for spatially resolving the neutron signal.

As to claim 42, Gomberg discloses a sensing head 70 disposed from vehicle 72 by and extension arm 80 (see Fig. 5 and paragraph bridging cols. 14 and 15).

6. Claims 36, 37, 39 and 40 are rejected under 35 U.S.C. 102(b) by Schultz et al.

As to claims 36 and 37, Schultz et al. disclose an embodiment using Cf-252 (see col. 9, lines 25+).

Art Unit: 3663

As to claims 39 and 40, Schultz et al. disclose using helium-3 detectors (see col. 8, lines 60+).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 41 is rejected under 35 U.S.C. 103(b) as being unpatentable over either one of Gomberg or Schultz et al. in view of either Hahn (U.S. 3,577,158) or Buchanan (U.S. 5,083,029). Either one of Gomberg or Schultz et al. disclose(s) the Applicant's claims except for the use of a neutron shield comprising  $^{10}\text{B}$ . Either one of Hahn or Buchanan teach a neutron shield comprising boron.

One having ordinary skill in the art would have recognized that all references are in the same field of endeavor and the teachings of Hahn or Buchanan would apply to the others. Note that the element boron disclosed in Hahn or Buchanan will inherently contain some  $^{10}\text{B}$  isotope because this isotope is found in natural boron.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by either one of Gomberg or Schultz et al., by the teachings of either one of Hahn or Buchanan, to include a neutron shield comprising a material containing  $^{10}\text{B}$ , because such modification is no more than the use of conventional designs/techniques within the

nuclear art, and the substitution of one neutron shield material by another well-known neutron shield material.

8. Claims 44-46 are rejected under 35 U.S.C. 103(b) as being unpatentable over either one of Gomberg or Schultz et al.

As to the limitation in the claims regarding the value of the time delay, this is a matter of optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A). This time delay depends on a plurality of parameters, including the energy of neutrons emitted by the source, the detector/target configuration, the nature of the target, etc., and the combination of these parameters have to be selected for optimum operation.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References E and F further illustrate prior art.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:30-5:00, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3663

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJP  
December 5, 2005

A handwritten signature in black ink, appearing to read "R. Palabrica". The signature is written in a cursive, flowing style with a large initial "R".